

SEQUENCE LISTING

<110> Isis Pharmaceuticals, Inc
 <120> Antisense Modulation Of IL-1 Receptor-Associated Kinase-1 Expression
 <130> ISPT1000
 <150> 10/167,034
 <151> 2002-06-10
 <160> 143
 <170> PatentIn version 3.2
 <210> 1
 <211> 20
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Antisense Oligonucleotide
 <400> 1
 tccgtcatcg ctcctcaggg 20
 <210> 2
 <211> 20
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Antisense Oligonucleotide
 <400> 2
 gtgcgcgcga gcccgaaatc 20
 <210> 3
 <211> 20
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Antisense Oligonucleotide
 <400> 3
 atgcattctg cccccaagga 20
 <210> 4
 <211> 3590
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> CDS
 <222> (80)..(2218)
 <400> 4
 cgcggacccg gccggcccag gccgcgcgcc gccgcggccc tgagaggccc cggcagggtcc 60
 cggcccggcg gcggcagcc atg gcc ggg ggg ccg ggc ccg ggg gag ccc gca 112
 Met Ala Gly Gly Pro Gly Pro Gly Glu Pro Ala
 1 5 10
 gcc ccc ggc gcc cag cac ttc ttg tac gag gtg ccg ccc tgg gtc atg 160
 Ala Pro Gly Ala Gln His Phe Leu Tyr Glu Val Pro Pro Trp Val Met

15	20	25	
tgc cgc ttc tac aaa gtg atg gac gcc ctg gag ccc gcc gac tgg tgc Cys Arg Phe Tyr Lys Val Met Asp Ala Leu Glu Pro Ala Asp Trp Cys 30 35 40			208
cag ttc gcc gcc ctg atc gtg cgc gac cag acc gag ctg cgg ctg tgc Gln Phe Ala Ala Leu Ile Val Arg Asp Gln Thr Glu Leu Arg Leu Cys 45 50 55			256
gag cgc tcc ggg cag cgc acg gcc agc gtc ctg tgg ccc tgg atc aac Glu Arg Ser Gly Gln Arg Thr Ala Ser Val Leu Trp Pro Trp Ile Asn 60 65 70 75			304
cgc aac gcc cgt gtg gcc gac ctc gtg cac atc ctc acg cac ctg cag Arg Asn Ala Arg Val Ala Asp Leu Val His Ile Leu Thr His Leu Gln 80 85 90			352
ctg ctc cgt gcg cgg gac atc atc aca gcc tgg cac cct ccc gcc ccg Leu Leu Arg Ala Arg Asp Ile Ile Thr Ala Trp His Pro Pro Ala Pro 95 100 105			400
ctt ccg tcc cca ggc acc act gcc ccg agg ccc agc agc atc cct gca Leu Pro Ser Pro Gly Thr Thr Ala Pro Arg Pro Ser Ser Ile Pro Ala 110 115 120			448
ccc gcc gag gcc gag gcc tgg agc ccc cgg aag ttg cca tcc tca gcc Pro Ala Glu Ala Glu Ala Trp Ser Pro Arg Lys Leu Pro Ser Ser Ala 125 130 135			496
tcc acc ttc ctc tcc cca gct ttt cca ggc tcc cag acc cat tca ggg Ser Thr Phe Leu Ser Pro Ala Phe Pro Gly Ser Gln Thr His Ser Gly 140 145 150 155			544
cct gag ctc ggc ctg gtt cca agc cct gct tcc ctg tgg cct cca ccg Pro Glu Leu Gly Leu Val Pro Ser Pro Ala Ser Leu Trp Pro Pro Pro 160 165 170			592
cca tct cca gcc cct tct tct acc aag cca ggc cca gag agc tca gtg Pro Ser Pro Ala Pro Ser Ser Thr Lys Pro Gly Pro Glu Ser Ser Val 175 180 185			640
tcc ctc ctg cag gga gcc cgc ccc tct ccg ttt tgc tgg ccc ctc tgt Ser Leu Leu Gln Gly Ala Arg Pro Ser Pro Phe Cys Trp Pro Leu Cys 190 195 200			688
gag att tcc cgg ggc acc cac aac ttc tcg gag gag ctc aag atc ggg Glu Ile Ser Arg Gly Thr His Asn Phe Ser Glu Glu Leu Lys Ile Gly 205 210 215			736
gag ggt ggc ttt ggg tgc gtg tac cgg gcg gtg atg agg aac acg gtg Glu Gly Gly Phe Gly Cys Val Tyr Arg Ala Val Met Arg Asn Thr Val 220 225 230 235			784
tat gct gtg aag agg ctg aag gag aac gct gac ctg gag tgg act gca Tyr Ala Val Lys Arg Leu Lys Glu Asn Ala Asp Leu Glu Trp Thr Ala 240 245 250			832
gtg aag cag agc ttc ctg acc gag gtg gag cag ctg tcc agg ttt cgt Val Lys Gln Ser Phe Leu Thr Glu Val Glu Gln Leu Ser Arg Phe Arg 255 260 265			880
cac cca aac att gtg gac ttt gct ggc tac tgt gct cag aac ggc ttc His Pro Asn Ile Val Asp Phe Ala Gly Tyr Cys Ala Gln Asn Gly Phe 270 275 280			928
tac tgc ctg gtg tac ggc ttc ctg ccc aac ggc tcc ctg gag gac cgt Tyr Cys Leu Val Tyr Gly Phe Leu Pro Asn Gly Ser Leu Glu Asp Arg 285 290 295			976
ctc cac tgc cag acc cag gcc tgc cca cct ctc tcc tgg cct cag cga			1024

Leu 300	His	Cys	Gln	Thr	Gln 305	Ala	Cys	Pro	Pro	Leu 310	Ser	Trp	Pro	Gln	Arg 315	
ctg	gac	atc	ctt	ctg	ggg	aca	gcc	cgg	gca	att	cag	ttt	cta	cat	cag	1072
Leu	Asp	Ile	Leu	Leu	Gly	Thr	Ala	Arg	Ala	Ile	Gln	Phe	Leu	His	Gln	
			320						325					330		
gac	agc	ccc	agc	ctc	atc	cat	gga	gac	atc	aag	agt	tcc	aac	gtc	ctt	1120
Asp	Ser	Pro	Ser	Leu	Ile	His	Gly	Asp	Ile	Lys	Ser	Ser	Asn	Val	Leu	
			335					340					345			
ctg	gat	gag	agg	ctg	aca	ccc	aag	ctg	gga	gac	ttt	ggc	ctg	gcc	cgg	1168
Leu	Asp	Glu	Arg	Leu	Thr	Pro	Lys	Leu	Gly	Asp	Phe	Gly	Leu	Ala	Arg	
		350					355					360				
ttc	agc	cgc	ttt	gcc	ggg	tcc	agc	ccc	agc	cag	agc	agc	atg	gtg	gcc	1216
Phe	Ser	Arg	Phe	Ala	Gly	Ser	Ser	Pro	Ser	Gln	Ser	Ser	Met	Val	Ala	
	365					370					375					
cgg	aca	cag	aca	gtg	cgg	ggc	acc	ctg	gcc	tac	ctg	ccc	gag	gag	tac	1264
Arg	Thr	Gln	Thr	Val	Arg	Gly	Thr	Leu	Ala	Tyr	Leu	Pro	Glu	Glu	Tyr	
380					385					390					395	
atc	aag	acg	gga	agg	ctg	gct	gtg	gac	acg	gac	acc	ttc	agc	ttt	ggg	1312
Ile	Lys	Thr	Gly	Arg	Leu	Ala	Val	Asp	Thr	Asp	Thr	Phe	Ser	Phe	Gly	
			400					405						410		
gtg	gta	gtg	cta	gag	acc	ttg	gct	ggg	cag	agg	gct	gtg	aag	acg	cac	1360
Val	Val	Val	Leu	Glu	Thr	Leu	Ala	Gly	Gln	Arg	Ala	Val	Lys	Thr	His	
			415					420					425			
ggg	gcc	agg	acc	aag	tat	ctg	aaa	gac	ctg	gtg	gaa	gag	gag	gct	gag	1408
Gly	Ala	Arg	Thr	Lys	Tyr	Leu	Lys	Asp	Leu	Val	Glu	Glu	Glu	Ala	Glu	
		430					435					440				
gag	gct	gga	gtg	gct	ttg	aga	agc	acc	cag	agc	aca	ctg	caa	gca	ggg	1456
Glu	Ala	Gly	Val	Ala	Leu	Arg	Ser	Thr	Gln	Ser	Thr	Leu	Gln	Ala	Gly	
	445					450					455					
ctg	gct	gca	gat	gcc	tgg	gct	gct	ccc	atc	gcc	atg	cag	atc	tac	aag	1504
Leu	Ala	Ala	Asp	Ala	Trp	Ala	Ala	Pro	Ile	Ala	Met	Gln	Ile	Tyr	Lys	
460					465				470						475	
aag	cac	ctg	gac	ccc	agg	ccc	ggg	ccc	tgc	cca	cct	gag	ctg	ggc	ctg	1552
Lys	His	Leu	Asp	Pro	Arg	Pro	Gly	Pro	Cys	Pro	Pro	Glu	Leu	Gly	Leu	
				480				485						490		
ggc	ctg	ggc	cag	ctg	gcc	tgc	tgc	tgc	ctg	cac	cgc	cgg	gcc	aaa	agg	1600
Gly	Leu	Gly	Gln	Leu	Ala	Cys	Cys	Cys	Leu	His	Arg	Arg	Ala	Lys	Arg	
			495					500					505			
agg	cct	cct	atg	acc	cag	gtg	tac	gag	agg	cta	gag	aag	ctg	cag	gca	1648
Arg	Pro	Pro	Met	Thr	Gln	Val	Tyr	Glu	Arg	Leu	Glu	Lys	Leu	Gln	Ala	
		510					515					520				
gtg	gtg	gcg	ggg	gtg	ccc	ggg	cat	ttg	gag	gcc	gcc	agc	tgc	atc	ccc	1696
Val	Val	Ala	Gly	Val	Pro	Gly	His	Leu	Glu	Ala	Ala	Ser	Cys	Ile	Pro	
		525				530					535					
cct	tcc	ccg	cag	gag	aac	tcc	tac	gtg	tcc	agc	act	ggc	aga	gcc	cac	1744
Pro	Ser	Pro	Gln	Glu	Asn	Ser	Tyr	Val	Ser	Ser	Thr	Gly	Arg	Ala	His	
540					545					550					555	
agt	ggg	gct	gct	cca	tgg	cag	ccc	ctg	gca	gcg	cca	tca	gga	gcc	agt	1792
Ser	Gly	Ala	Ala	Pro	Trp	Gln	Pro	Leu	Ala	Ala	Pro	Ser	Gly	Ala	Ser	
				560				565						570		
gcc	cag	gca	gca	gag	cag	ctg	cag	aga	ggc	ccc	aac	cag	ccc	gtg	gag	1840
Ala	Gln	Ala	Ala	Glu	Gln	Leu	Gln	Arg	Gly	Pro	Asn	Gln	Pro	Val	Glu	
			575					580					585			

agt gac gag agc cta ggc ggc ctc tct gct gcc ctg cgc tcc tgg cac Ser Asp Gln Ser Leu Gly Gly Leu Ser Ala Ala Leu Arg Ser Trp His 590 595 600	1888
ttg act cca agc tgc cct ctg gac cca gca ccc ctg agg gag gcc ggc Leu Thr Pro Ser Cys Pro Leu Asp Pro Ala Pro Leu Arg Glu Ala Gly 605 610 615	1936
tgt cct cag ggg gac acg gca gga gaa tgc agc tgg ggg agt ggc cca Cys Pro Gln Gly Asp Thr Ala Gly Glu Ser Ser Trp Gly Ser Gly Pro 620 625 630 635	1984
gga tcc cgg ccc aca gcc gtg gaa gga ctg gcc ctt ggc agc tct gca Gly Ser Arg Pro Thr Ala Val Glu Gly Leu Ala Leu Gly Ser Ser Ala 640 645 650	2032
tca tgc tgc tca gag cca ccg cag att atc atc aac cct gcc cga cag Ser Ser Ser Ser Glu Pro Pro Gln Ile Ile Ile Asn Pro Ala Arg Gln 655 660 665	2080
aag atg gtc cag aag ctg gcc ctg tac gag gat ggg gcc ctg gac agc Lys Met Val Gln Lys Leu Ala Leu Tyr Glu Asp Gly Ala Leu Asp Ser 670 675 680	2128
ctg cag ctg ctg tgc tcc agc tcc ctc cca ggc ttg ggc ctg gaa cag Leu Gln Leu Leu Ser Ser Ser Ser Leu Pro Gly Leu Gly Leu Glu Gln 685 690 695	2176
gac agg cag ggg ccc gaa gaa agt gat gaa ttt cag agc tga Asp Arg Gln Gly Pro Glu Glu Ser Asp Glu Phe Gln Ser 700 705 710	2218
tgtgttcacc tgggcagatc ccccaaattcc ggaagtcaaa gttctcatgg tcagaagtcc	2278
tcagtgtgca cgagtcctca gcactctgcc ggagtgggg gtggggggccc atgcccgcgg	2338
gggagagaag gaggtggccc tgctgttcta ggctctgtgg gcataggcag gcagagtgga	2398
accctgcctc catgccagca tctgggggca aggaaggctg gcatcatcca gtgaggaggc	2458
tggcgcatgt tgggaggctg ctggctgcac agaccctga ggggaggaga ggggctgctg	2518
tgcaggggtg tggagtaggg agctggctcc cctgagagcc atgcagggcg tctgcagccc	2578
aggcctctgg cagcagctct ttgccatct ctttgacag tggccaccct gcacaatggg	2638
gccgacgagg cctagggccc tcctacctgc ttacaatttg gaaaagtgtg gccgggtgcg	2698
gtggctcacg cctgtaatcc cagcactttg ggaggccaag gcaggaggat cgctggagcc	2758
cagtaggtca agaccagcca gggcaacatg atgagaccct gtctctgcca aaaaattttt	2818
taaactatta gcctggcgtg gtacgcacg cctgtgttcc cagctgctgg ggaggctgaa	2878
gtaggaggat catttatgct tgggaggtcg aggctgcagt gagtcatgat tgtatgactg	2938
cactccagcc tgggtgacag agcaagaccc tgtttcaaaa agaaaaaccc tgggaaaagt	2998
gaagtatggc tgtaagtctc atggttcagt cctagcaaga agcgagaatt ctgagatcct	3058
ccagaaagtc gagcagcacc cacctccaac ctcgggccag tgtcttcagg ctttactggg	3118
gacctgcgag ctggcctaata gtggtggcct gcaagccagg ccatccctgg gcgccacaga	3178
cgagctccga gccaggtcag gcttcggagg ccacaagctc agcctcaggc ccaggcactg	3238
attgtggcag aggggcccact acccaaggctc tagctaggcc caagacctag ttaccagac	3298
agtgagaagc ccctggaagg cagaaaagtt gggagcatgg cagacaggga agggaaacat	3358
tttcagggaa aagacatgta tcacatgtct tcagaagcaa gtcaggtttc atgtaaccga	3418

gtgtcctctt gcgtgtccaa aagtagccca gggctgtagc acaggcttca cagtgatttt 3478
 gtgttcagcc gtgagtcaca ctacatgccc ccgtgaagct gggcattggg gacgtccagg 3538
 ttgtccttga gtaataaaaaa cgtatgttcc ctaaaaaaaaaa aaaaaggaat tc 3590

<210> 5
 <211> 712
 <212> PRT
 <213> Homo sapiens

<400> 5

Met Ala Gly Gly Pro Gly Pro Gly Glu Pro Ala Ala Pro Gly Ala Gln
 1 5 10 15
 His Phe Leu Tyr Glu Val Pro Pro Trp Val Met Cys Arg Phe Tyr Lys
 20 25 30
 Val Met Asp Ala Leu Glu Pro Ala Asp Trp Cys Gln Phe Ala Ala Leu
 35 40 45
 Ile Val Arg Asp Gln Thr Glu Leu Arg Leu Cys Glu Arg Ser Gly Gln
 50 55 60
 Arg Thr Ala Ser Val Leu Trp Pro Trp Ile Asn Arg Asn Ala Arg Val
 65 70 75 80
 Ala Asp Leu Val His Ile Leu Thr His Leu Gln Leu Leu Arg Ala Arg
 85 90 95
 Asp Ile Ile Thr Ala Trp His Pro Pro Ala Pro Leu Pro Ser Pro Gly
 100 105 110
 Thr Thr Ala Pro Arg Pro Ser Ser Ile Pro Ala Pro Ala Glu Ala Glu
 115 120 125
 Ala Trp Ser Pro Arg Lys Leu Pro Ser Ser Ala Ser Thr Phe Leu Ser
 130 135 140
 Pro Ala Phe Pro Gly Ser Gln Thr His Ser Gly Pro Glu Leu Gly Leu
 145 150 155 160
 Val Pro Ser Pro Ala Ser Leu Trp Pro Pro Pro Pro Ser Pro Ala Pro
 165 170 175
 Ser Ser Thr Lys Pro Gly Pro Glu Ser Ser Val Ser Leu Leu Gln Gly
 180 185 190
 Ala Arg Pro Ser Pro Phe Cys Trp Pro Leu Cys Glu Ile Ser Arg Gly
 195 200 205
 Thr His Asn Phe Ser Glu Glu Leu Lys Ile Gly Glu Gly Gly Phe Gly
 210 215 220

Cys Val Tyr Arg Ala Val Met Arg Asn Thr Val Tyr Ala Val Lys Arg
 225 230 235 240
 Leu Lys Glu Asn Ala Asp Leu Glu Trp Thr Ala Val Lys Gln Ser Phe
 245 250 255
 Leu Thr Glu Val Glu Gln Leu Ser Arg Phe Arg His Pro Asn Ile Val
 260 265 270
 Asp Phe Ala Gly Tyr Cys Ala Gln Asn Gly Phe Tyr Cys Leu Val Tyr
 275 280 285
 Gly Phe Leu Pro Asn Gly Ser Leu Glu Asp Arg Leu His Cys Gln Thr
 290 295 300
 Gln Ala Cys Pro Pro Leu Ser Trp Pro Gln Arg Leu Asp Ile Leu Leu
 305 310 315 320
 Gly Thr Ala Arg Ala Ile Gln Phe Leu His Gln Asp Ser Pro Ser Leu
 325 330 335
 Ile His Gly Asp Ile Lys Ser Ser Asn Val Leu Leu Asp Glu Arg Leu
 340 345 350
 Thr Pro Lys Leu Gly Asp Phe Gly Leu Ala Arg Phe Ser Arg Phe Ala
 355 360 365
 Gly Ser Ser Pro Ser Gln Ser Ser Met Val Ala Arg Thr Gln Thr Val
 370 375 380
 Arg Gly Thr Leu Ala Tyr Leu Pro Glu Glu Tyr Ile Lys Thr Gly Arg
 385 390 395 400
 Leu Ala Val Asp Thr Asp Thr Phe Ser Phe Gly Val Val Val Leu Glu
 405 410 415
 Thr Leu Ala Gly Gln Arg Ala Val Lys Thr His Gly Ala Arg Thr Lys
 420 425 430
 Tyr Leu Lys Asp Leu Val Glu Glu Glu Ala Glu Glu Ala Gly Val Ala
 435 440 445
 Leu Arg Ser Thr Gln Ser Thr Leu Gln Ala Gly Leu Ala Ala Asp Ala
 450 455 460
 Trp Ala Ala Pro Ile Ala Met Gln Ile Tyr Lys Lys His Leu Asp Pro
 465 470 475 480
 Arg Pro Gly Pro Cys Pro Pro Glu Leu Gly Leu Gly Leu Gly Gln Leu
 485 490 495
 Ala Cys Cys Cys Leu His Arg Arg Ala Lys Arg Arg Pro Pro Met Thr
 500 505 510

Gln Val Tyr Glu Arg Leu Glu Lys Leu Gln Ala Val Val Ala Gly Val
515 520 525

Pro Gly His Leu Glu Ala Ala Ser Cys Ile Pro Pro Ser Pro Gln Glu
530 535 540

Asn Ser Tyr Val Ser Ser Thr Gly Arg Ala His Ser Gly Ala Ala Pro
545 550 555 560

Trp Gln Pro Leu Ala Ala Pro Ser Gly Ala Ser Ala Gln Ala Ala Glu
565 570 575

Gln Leu Gln Arg Gly Pro Asn Gln Pro Val Glu Ser Asp Glu Ser Leu
580 585 590

Gly Gly Leu Ser Ala Ala Leu Arg Ser Trp His Leu Thr Pro Ser Cys
595 600 605

Pro Leu Asp Pro Ala Pro Leu Arg Glu Ala Gly Cys Pro Gln Gly Asp
610 615 620

Thr Ala Gly Glu Ser Ser Trp Gly Ser Gly Pro Gly Ser Arg Pro Thr
625 630 635 640

Ala Val Glu Gly Leu Ala Leu Gly Ser Ser Ala Ser Ser Ser Ser Glu
645 650 655

Pro Pro Gln Ile Ile Ile Asn Pro Ala Arg Gln Lys Met Val Gln Lys
660 665 670

Leu Ala Leu Tyr Glu Asp Gly Ala Leu Asp Ser Leu Gln Leu Leu Ser
675 680 685

Ser Ser Ser Leu Pro Gly Leu Gly Leu Glu Gln Asp Arg Gln Gly Pro
690 695 700

Glu Glu Ser Asp Glu Phe Gln Ser
705 710

<210> 6
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR Primer

<400> 6
acttctcggg gagctcaag atc

23

<210> 7
<211> 22
<212> DNA
<213> Artificial Sequence

<220>

<223> PCR Primer

<400> 7

gcatacaccg tggtcctcat ca

22

<210> 8

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR Probe

<400> 8

cgccccgtac acgcacccaa

20

<210> 9

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR Primer

<400> 9

gaaggtgaag gtcggagtc

19

<210> 10

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR Primer

<400> 10

gaagatggtg atgggatttc

20

<210> 11

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR Probe

<400> 11

caagcttccc gttctcagcc

20

<210> 12

<211> 13000

<212> DNA

<213> Homo sapiens

<400> 12

ctcacatgac agcatggtgc tgcgtttcct cattggatct ggctgtccct ggacacaggt

60

agctgccttc aggcctgcc aagcggcca aggaagcct cctccatatt ctggcctcgc

120

tgccccctca gcttcttcca agccagtgtc ctccaggcac actgctccag cgtgtgacgg

180

gaagggcctg gcatgagtca gcctgcagca caacctccct gctccagacc cgtatggtag

240

gggcaccccc taggtctgga tgtgtgtgtg tgcttttggg cccccccacc cccgcaggct

300

gtggctcctc ctgtgtctca ttctggccag gacctcacg tgccctctgt tgactgctaa

360

cgtaggttctc	tgaccaggca	agggcaggct	gaggggtttg	cccaaagggg	gcccccttgt	420
tactggcttc	cttggctctc	aggagcagcc	tcaccagggt	ggtaaggggc	tggaggagac	480
aactgctcaa	aggagtcacg	cttcacatgc	acatgctaga	aggtaccctc	ggaaggcctg	540
gccttcaaag	gtagatccca	gggttgaaaa	gtcaacttgt	atgcattgag	catctcgtat	600
gccagccctg	ttccgtgagc	tgatgggcct	ttgtgtgtaa	gtaggaccaa	gtgccccgt	660
ggaggttagc	atgggtgtgc	agtcatttca	gatacttgag	ttggtacatc	tcagtaaagt	720
ctgtcccgtg	agaagccatg	ggtttcatgg	tatggttggc	atcttccttg	ggagtggcca	780
cagtgggtgt	ggcttcagga	aagagactcc	aacagggggc	agctgtgggc	cttgggcact	840
tctcgtttct	aggaaaagtc	ctaagtctgt	agggctaggg	gtggggaacc	ccttcgctgt	900
caggatcaag	agggcaaggg	gaactgtcgc	tggaggagac	atccagctgg	agaaacaaaa	960
gagtaagtct	gcgttgctgc	ttgtgggggc	ttccccatct	cagggcgggg	accgggggtg	1020
gcggtccaga	caagtaatca	aggacgatgc	ccaggagggg	acaggtaacg	ggtggcagga	1080
gctctgccgg	cgggctcagg	aagccttcac	cacagctgcc	tgagctcacc	cttgccaaat	1140
gagggctggg	gcagcagcaa	cgcatacact	cacggctgtg	gcgggcagcg	ttctcggcat	1200
atttcaggac	acctaaggag	actgaatggc	tcaaggctgc	tgccgtgtgc	agggggctag	1260
acgtggggcg	ggcaggcagg	gctcctggta	acagccctgc	aggccgcagt	ggagagcagg	1320
gttccggcag	ggccgcccag	gagctttcgg	aaggcccggc	cccggcccct	ttccgagcag	1380
cccgggcctc	cgccctgccc	tctgtcccca	acgcggggag	ccgcccgttcg	tcctccagag	1440
ccccgcccgg	gcgagcccgg	gaggccgatc	gccgctcgcg	gaaccgcgcg	ggaccggggc	1500
cctccccggc	gcggggcgcc	cccgtgtgac	ccagcgcgcg	gccgcggcgc	gcaagatggc	1560
ggcggggccc	ggcaccgccc	cttcgccccc	gccggggcgtc	gcacgaggcc	ggctcgaagg	1620
ggaagtgagt	cagtgtccgc	ggaccggggc	ggcccaggcc	cgcgcccgcg	gcggccctga	1680
gaggccccgg	caggtcccgg	cccggcgggc	gcagccatgg	ccgggggggc	gggcccgggg	1740
gagcccgag	cccccgggc	ccagcacttc	ttgtacgagg	tgccgccctg	ggtcatgtgc	1800
cgcttctaca	aagtgatgga	cgccctggag	cccgcgagct	ggtgccagtt	cggtgggtgg	1860
cggcgggctg	ccggggggcg	ggaggcgcg	gggtcctcgg	cgccgacgce	tgacgcccc	1920
cgccccgag	ccgccctgat	cgtgcgcgac	cagaccgagc	tgcggtgtg	cgagcgctcc	1980
gggcagcgca	cggccagcgt	cctgtggccc	tggatcaacc	gcaacgcccg	tgtggccgac	2040
ctcgtgcaca	tcctcacgca	cctgcagctg	ctccgtgcgc	gggacatcat	cacagcctgt	2100
gagcgcggga	ctccgggcac	cccacggctg	ggaggccggc	gggccccacg	gggtccccc	2160
accggggcct	caaccttcct	ttccttcctt	ggcgtcccag	ggcaccctcc	cgccccgctt	2220
ccgtccccag	gcaccactgc	cccaggcccc	agcagcatcc	ctgcaccgcg	cgaggccgag	2280
gcctggagcc	cccgggaagt	gccatcctca	gcctccacct	tcctctcccc	aggtaagagg	2340
gcccggttgt	taggctcggg	ggacccaaa	aagagcccac	cttgaccacg	gccacggctg	2400
tagaccctgc	tgtgtgtctc	tgcctgcctc	tcactgggtg	ctttatgaag	cttttccagg	2460

ctcccagacc cattcagggc ctgagctcgg cctgggtccca agccctgctt ccctgtggcc	2520
tccaccgccca tctccagccc cttctttctac caaggtaggt gtcccctgcc ccccagggaa	2580
gattcgagac aaggaggaag gaattcagcc tttgatgtag cgcagagccc cagtcagcca	2640
agctgggtca gctgggagggc agctgtggtg gggagagcct ggagccttgg gcagaaggga	2700
agagacaggg accccacctg atccaggtc tcttcccaca gccaggccca gagagctcag	2760
tgteccctcct gcaggggagcc cgtccctttc cgttttctg gcccctctgt gagatttccc	2820
ggggcaccca caacttctcg gaggagctca agatcgggga ggggtggcttt ggggtgcgtgt	2880
accgggcggt gatgaggaac acggtgtatg ctgtgaagag gctgaaggag gtgagtgtcg	2940
caccctggca gggaccctgg aaggccatca gataaccctc accacttctc cagcctttcc	3000
ccctcgcttc cccacacaac tccttcagcc ctcattctgg cgtagggtcc ctggccctt	3060
ggtggttctg ggcctcgggt aggtggcact ggtggcccga aggccttcgc ttcgagagcc	3120
tcacgctgcc cgtcttccct gccccttccc ccaccgcacc ctgggggctg cagaacgctg	3180
acctggagtg gactgcagtg aagcagagct tcctgaccga ggtggagcag ctgtccaggt	3240
gaggccagag ggggagccac accaggtccc gtggggcttc agaccgcaca ccacaggacc	3300
tggtccctt gggcacctga ggcctggcag gcccgggcca gctgaggccc cagccagggc	3360
tgcccaccca gtctggcctg atggaaagtg ctcccctttt tcaaacaggt ttcgtcacc	3420
aaacattgtg gactttgtg gctactgtgc tcagaacggc ttctactgcc tgggtgtacgg	3480
cttccctgcc aacggctccc tggaggaccg tctccactgc caggtaggct caccctggccc	3540
ggcacgcttc ccaggaccca aagcactcct gacacctggc tggagccggg cgcggggcct	3600
agggtttca gcctgtgtga gtgggtcctg ccagcaggcc aggcctgcac ttccagctcc	3660
ccagcagcac ccggctcagg atttggtcca cgggtgggtc aatttttttt ttttttttt	3720
tttttttttt tttgaggtgg agtcttctc tgtcatccag gctggagtgc agtgggtgtga	3780
tctcagctca ccacaacctc cacctcccgg gttcaggcga tcctcctgcc gcagcctccc	3840
gagtagctgg gactacaggc atgcaccacc acacctgcct aatttttgta ttttttagtag	3900
agatgaggtt ttgccacatt ggccaggcta gtctcgaact cctgacocca ggtggtctgc	3960
gcgctcagc ctcccaaagt gctgggatta caggcgtgag ccaccacgcc tggcccagcc	4020
caatgttttc tatagagctc tttcccaggc ctctcccctt tgcaagcagc gtagctggag	4080
ggtctcatca gcaagccccg gaggcgaggg ggtctggggc taccagctgg accacctaca	4140
gctgagggag ggcccccttg cctcctcctg catgctgcgt ttggggagag cgggaagaat	4200
gccttcaagg acttcccagc caccagggac aaagggatga gccctgggag ccgaagccca	4260
gcagattcta ttgaacgtgt ccccagccat tgcttaagaa gtgcaggtca cggagacttt	4320
gctcctcgtt ttccagaagg gggaaactga ggcctagaga gtgaagtggc tgttccaggc	4380
tgcacggtga caggtagaag gatggttggg atcaaggaac ggccatccag caacctcccc	4440
tgtccccctt tgccaccca gaccaggcc tgcccacctc tctcctggcc tcagcgactg	4500
gacatccttc tgggtacagc ccgggcaatt cagtttctac atcaggacag cccagcctc	4560
atccatggag acatcaagag gtgaggaggg gcccttgaga actgccgggg cagggcctgc	4620

agcaaggggg	gccccgcgtc	ctatcaatgt	ggggatcagg	catggcctgg	gacctcaaca	4680
ccccggcatc	gcacaggtgt	gggaacgggc	caaggatggg	ccctactgat	gagcagagggc	4740
ccccaggcag	ctggagcgct	cagggcagtg	ccagcgcttt	ctgtgggcaa	ggcacogggc	4800
tggcagcctc	gagtccagcc	ttatctaagc	cgggcaggtg	taggagctag	gaccgggctg	4860
acgccactgt	cttctctccc	caagttccaa	cgctcttctg	gatgagagggc	tgacacccaa	4920
gctgggagac	tttggcctgg	cccggttcag	ccgctttgcc	gggtccagcc	ccagccagag	4980
cagcatgggtg	gcccggacac	agacagtgcg	gggcaccctg	gcctacctgc	ccgaggagta	5040
catcaagacg	ggaaggctgg	ctgtggacac	ggacaccttc	agctttgggg	tggtgagcca	5100
ctgacccttc	tgctggctca	gaggaggaga	agccacaggc	aggcagaggt	gggggctgca	5160
gagtgcactg	cgggccaggg	gccatctgcc	aagaccccag	gaggctgcag	ctccagggtc	5220
ccctccctc	cgaggccctc	ctcctcacc	tgacacctaac	tgtgtgtttg	taatttgtct	5280
tcaagtgggc	tctccgagtt	gcccagagctt	cagtcccata	acatctggct	ctgcctttgt	5340
ccacaccctt	gtcaggccca	atccatgtcc	acaccagagg	cctcttccct	gccaaggcca	5400
ctgccatgct	ctccctcttc	cctctctcca	gtagtgcta	gagaccttgg	ctggtcagag	5460
ggctgtgaag	acgcacggtg	ccaggaccaa	gtatctgggtg	agccccttga	ggcagggcca	5520
ggagggacac	acagctgctg	gcagccagca	ggcacagccc	cagtggcggg	gataactggg	5580
gcgcagtgcc	catggatgcc	tctgctgcca	cagtggcctc	atTTTTgaaa	gtaggcaggg	5640
ctccaaacaa	cttcgtttac	cttgccgagg	acaaacctgt	ctgtcctgca	gacactatgg	5700
gccttgtaca	gaccccacct	gggctggggg	cagggggaag	ggcgggtcca	gggactgag	5760
acccaagctg	cagtggaact	cagaggactc	tggccggaga	aaggcggtgg	tagagaagaa	5820
gcaggccccc	aggaacctcc	tgggccccag	caggctgcag	ctgagctctc	cgcaccgtgc	5880
agggcagcct	gagctgcctc	acggtcttac	tccactcagt	ctgcctcacc	gtggactgtg	5940
gtggggccag	gagactagag	acctgggttt	tagccccagc	ctgacagtgg	ccttccagca	6000
aattcctgct	cccctgtggg	cctgttttcc	catatgcaa	acagacttca	cagaatgtgc	6060
tcagccagta	attgcttcac	tgcttctcct	cttggttggg	gcggttcctg	tgtgctgtgg	6120
ggtctccgtc	aggattcagc	cccgtgaga	accaggagc	cgggcttgag	ccctccttcc	6180
tttcccttcc	ccgtccgtcc	atccatgcat	cctgctgaag	aagcgacca	ggctccttgg	6240
gggtccttgg	acttccccac	ttgctcccca	ccctgcagcc	aaagtgtctc	tttcaaaggc	6300
ccctttgcct	tttctctgct	cttgggttga	aggcccagtc	ccttatgtgg	ttgaccccc	6360
aacgccccag	gtccctggga	ctcggggcgc	tccctgctgc	ctgcttcaca	gccttagtat	6420
gtgccgttcg	ctctgcgaga	aaagccaccg	cccaccagc	tggttcctcc	tggtctgtct	6480
gatttcagaa	ctggagatgg	cctccggtcc	tgtttccacc	ctgggggcgc	ctctctgcgg	6540
ggcgctctc	tctctgggg	acctctttgt	ctgtggggca	cctctctgtg	ggcgctttc	6600
cttctcggtc	ctgccctctc	aggctacttc	ctgccttcag	accccagctc	catggggctc	6660
tccccacca	ggaagtcagc	tctgtcaaac	cgggtccag	ggttctgttt	gttcctgtat	6720

ccctaggggcc	cagagcacca	ctggcccaca	gtagggtgtt	aataaatctc	tagaagctac	6780
tcgggaatct	gaggcaggag	gatcgcttga	gcctgggagt	tggagaccag	cctgggcaac	6840
atagcaagat	aggcatggtg	gtacacacct	gtaatcccag	ctgctcggga	ggccgaggtg	6900
ggaggatcac	gagcctggga	ggttgaggct	gcactgagcc	atgattgcac	cactgcactc	6960
cagcctgggt	gacagaatga	gtccctgtct	cagaaaaaaa	gtaagttgta	gaaagaccaa	7020
gagctgtggc	acagtgtctc	acacctgtaa	caccagcact	ttgggaggct	gaggcgggag	7080
gatcacttga	gcctacttgg	agaccagcca	ggccaacaaa	gcgagacccc	atctcttttt	7140
tttttttttt	tttttttata	aaaaccata	cgattgagt	acaaggacct	gaggactgca	7200
gctgcagggt	tggccacctg	gtagccatac	tgacagtatt	tatcccacag	aaagacctgg	7260
tggaagagga	ggctgaggag	gctggagtgg	ctttgagaag	caccagagc	acactgcaag	7320
cagggtctggc	tgcagatgcc	tgggctgctc	ccatcgccat	gcagatctac	aagaagcacc	7380
tggaccccag	gcccggggcc	tggccacctg	agctgggcct	gggcctgggc	cagctggcct	7440
gctgctgcct	gcaccgccgg	gccaaaagga	ggcctcctat	gaccaggtta	gccagctgcg	7500
cactgggacg	gggtggccag	atagaaagcc	cgcattccag	gccttgctct	gtagtgaccc	7560
catctcagca	cctgctaggt	ctctctggag	tctccacaca	tttcttgctt	gccctttggt	7620
tctgtttggg	gcagcgcccc	tctgaactga	ggggcccccg	gcagtccctgc	tttgcggagc	7680
ccagctccga	cccccttcac	atagagagaa	ggaaagagct	gctgccgcgc	ccctgctggt	7740
gcgcaactga	ctactgcata	tgcctttttc	tgtcccctcc	ctagtacccc	acctcttctc	7800
ctctggtgac	agttgaaaat	ggagaggccc	cgtttgaggg	cagcggggca	gtgagattca	7860
ttttgtagaa	aagaacgagg	ccattctcag	tccttgcttt	tggcagccgc	gcttctcagc	7920
actccctgtg	atgggaacag	aggggagagg	ggcagagcgt	tcccagctgc	agggtatgtc	7980
attttagagc	cctggggcag	gtcacggacg	gcctggagca	gccctgtggt	ttgcccacgg	8040
ggtgaccggc	cagggctgcc	atctcaccct	gagagtccct	cttttccact	tgaggtgta	8100
cgagaggcta	gagaagctgc	aggcagtggg	ggcgggggtg	cccgggcatt	cggaggccgc	8160
cagctgcata	cccccttccc	cgcaggagaa	ctcctacgtg	tccagcactg	gcagagccca	8220
cagtggggct	gctccatggc	agcccctggc	agcgccatca	ggagccagt	cccaggcagc	8280
agagcagctg	cagagaggcc	ccaaccagcc	cgtggagagt	gacgagagcc	taggcggcct	8340
ctctgctgcc	ctgcgtcct	ggcacttgac	tccaagctgc	cctctggacc	cagcaccct	8400
cagggaggcc	ggctgtcctc	agggggacac	ggcaggagaa	tcgagctggg	ggagtggccc	8460
aggatcccgg	cccacagccg	tggaaggtag	ctggggagac	gggttcccag	gagagggacc	8520
aaggcctctt	tgggccaaaag	cccctgtaag	tccccacccc	agccttctag	aagagaacca	8580
gggccaatg	ttcagctcac	tgtgacctta	gcaaccctgg	tttcccctcc	ccaggccaca	8640
tccttcccag	gtggagcttg	ctctccagcc	ctccccccac	ccattcctg	aaggctggga	8700
acaaggaggg	ctctgtctgg	tagcctgaga	gctggggcct	gcccttgga	ttctctgagg	8760
aattcaggcc	tgaggccagg	gaggcagggt	gctaggctgc	gggctgggga	gccacagcat	8820
gaggctaagg	gagtgccatc	tccaccccag	gactggccct	tggcagctct	gcacatcgt	8880

cgtcagagcc accgcagatt atcatcaacc ctgcccagaca gaagatgggtc cagaagctgg	8940
ccctgtacga ggatggggcc ctggacagcc tgcagctgct gtcgtccagc tccctcccag	9000
gtgctgccgc ccaggctggc ctctggggtg ctccagcgca tccgtgtcag ccccaaagag	9060
cagagtgtct gtcccactg cgctgagggc gtggggcagc cgggcaggcc actggctctg	9120
gcgacctcta gaagcccagc cggccccaca tgcctccctt agcaagacc tggcccactc	9180
cttccctcgc ctctgacag tagcacctcc tttagcccga ggggtgcctgc cccactctgt	9240
gctttcagga aataggaagc ccagcagga attttccatc ccaggctacta tttgaagaac	9300
cactgcttag gaaccctcag ctgggcgagg tggctcatgc ctataatacc agcacttttg	9360
gaggccaaga tgggaggatc acttgagccc aggaggtgga ggctacagtg agctgtgatc	9420
aagccactgc actccagcct gggagacagt tagaccctgt ctcaaaaaca aatgaacaaa	9480
caaacaaaaa ccctcaattc ccacgaacgc ccaggagat aagggagcat ggcccaggcc	9540
ttgagccagg gcttctggca gtaggggagc ctccccatt tgctaagcgg actttcctct	9600
tccttctgta ggcttgggcc tggaacagga caggcagggg cccgaagaaa gtgatgaatt	9660
tcagagctga tgtgttcacc tgggcagatc ccccaaacc ggaagtcaaa gttctcatgg	9720
tcagaagttc tcatggtgca cgagtcctca gcaactctgcc ggcaagtggg gtgggggccc	9780
atgcccgcgg gggagagaag gaggtggccc tgctgttcta ggctctgtgg gcataggcag	9840
gcagagtgga accctgcctc catgccagca tctgggggca aggaaggctg gcatcatcca	9900
gtgaggaggc tggcgcatgt tgggaggctg ctggctgcac agaccctga ggggaggaga	9960
ggggtgctg tgcaggggtg tggagtaggg agctggctcc cctgagagcc atgcagggcg	10020
tctgcagccc aggcctctgg cagcagctct ttgccatct ctttggacag tggccaccct	10080
gcacaatggg gccgacgagg cctagggccc tcctacctgc ttacaatttg gaaaagtgtg	10140
gccgggtgcg gtggctcacg cctgtaatcc cagcactttg ggaggccaag gcaggaggat	10200
cgctggagcc cagtaggtca agaccagcca gggcaacatg atgagaccct gtctctgcca	10260
aaaaattttt taaactatta gcctggcgtg gtagcgcacg cctgtggtcc cagctgctgg	10320
ggaggctgaa gtaggaggat catttatgct tgggaggtcg aggctgcagt gagtcatgat	10380
tgtatgactg cactccagcc tgggtgacag agcaagacc tgtttcaaaa agaaaaaccc	10440
tgggaaaagt gaagtatggc tgtaagtctc atggttcagt cctagcaaga agcgagaatt	10500
ctgagatcct ccagaaagtc gagcagcacc cacctccaac ctcgggccag tgtcttcagg	10560
ctttactggg gacctgcgag ctggcctaata gtggtggcct gcaagccagg ccatccctgg	10620
gcgccacaga cgagctccga gccaggtcag gcttcggagg ccacaagctc agcctcaggc	10680
ccaggcactg attgtggcag aggggccact acccaaggct tagctaggcc caagacctag	10740
ttaccagac agtgagaagc ccctggaagg cagaaaagtt gggagcatgg cagacaggga	10800
agggaaacat tttcagggaa aagacatgta tcacatgtct tcagaagcaa gtcaggtttc	10860
atgtaaccga gtgtcctctt gcgtgtccaa aagtagccca gggctgtagc acaggcttca	10920
cagtgatatt gtgttcagcc gtgagtcaca ctacatgccc ccgtgaagct gggcattggt	10980

gacgtccagg ttgtccttga gtaataaaaa cgtatgttgc aatctcgggc tctacttgtg 11040
gactttgttg caccgaaagc cttgagcttt cctgatgcct tacacttcag gggttcttgag 11100
cgtccagggt cttgttacta ctctgggctg gccacacca gcacttcccg tgtcagggtt 11160
ttcctgatgt agtccatgtt ttttatgcta ttctaaatgg tatctttgat tttctagttc 11220
atcatgatat tatacagaaa tgcaattgat gctgggcacg gtggctcacg cctgtgattc 11280
cagcgctttg ggaagctaag gcgggcagat cacttgaggc caggagtgtg agaccagcct 11340
gggcaacatg gcgaaacccc gtctctacaa aaagtacaaa aattagccag gcatgggtgt 11400
gcatgcctgt agtttgagct actcaggagg ctgaccagg aggatagttt gagcccagga 11460
cgttgaggct gcagtgagcc atgattccac cactgcactc cagcccgggc aacagaggga 11520
gaccttgcct caaaaaaaaa aaaaaaaaaa aaaaaagcgg ttgagttttg catatgaacc 11580
gtatattctg tgaccttgtt taaattcttt tttttttttc tttttttgag atggagtttt 11640
gctcttgttg ccagggtgc agtgcaatgg cgctatctca gctcactgca acctctgcct 11700
cctagggttca agtgattctc ctgcctcagc ctcccagta gctgggatta cagggtgcca 11760
ccaccacacc cggctaattt ttttgtattt ttaatagaga cagggtttcc acatgttgac 11820
caggctggtc tcgaactcct gacctccagt gatccgccc cctcggcctc ccaaagtgt 11880
agattacagg tgtgagccac tgcacctgtc cctggctgtc tgtatattta cttttttttt 11940
tgagatggag tttcgtctt gtccaccagg ctgcagtgca atgggtcgat ctgggtcat 12000
tgtaacctct gcctcccagg ttcagggtgat tctcctgcct cagtctccc agtagctggg 12060
attacaggcg tccgtacca cgcccgactg atttttctat ttttagtaga gacgggggtt 12120
caacatgttg gccagtctga tctcgaactc ctgacctcag gtgattcacc cacctcagcc 12180
tcccaaagtg ctgggattac aggtatgagg cactgtgccc ggcttttttt tttttttttt 12240
ttttcttcag acaagagtct tactctgtca ccagggtga agtgagtggt tgcaatcttg 12300
gctcactgca acctccgcct ccagggttca agcgattctt ctgcctcagc ctccatagta 12360
gctgggacta cagggtgtgt ccaccacgcc cagctaattt ttatatattt atttagtaga 12420
gacaagggtt caccatgttg gccaaagtgg tctcgaactc ctgacctcaa gtgatctgcc 12480
cgctcagcc tcccaaagtg ctgggattac aggtgtgagc cgtggcacc agcccagcct 12540
tattctttta aacaatctga caatctctgc ctttaggttg tctgtttaat ccatttccat 12600
ttaatgggtg gagttaagtc tatcatcttg ttatttgttt tctattacc catctgtttt 12660
gacttttgga ttaattacat atttctggga ttctgttttt tctctgctat tggcttggtc 12720
gctctagtaa ttcagtgaga ctgctggttc cgctcaggcc cctttgctga accatgggtg 12780
gaaagtgcct ccaggcagaa actcagggtg cttgtaaggc tcaccttctt tgttttctct 12840
ctggtcacag ccctgcacag cctattgtcc gatattctaaa aatagttgcc cagtgtttta 12900
gggttttaca actggcatca gttattccac tgtggccaga attgcaagtt tctcctcttt 12960
tctgaggact tcttactca taatgtcacc cgacatgatc 13000

<210> 13
<211> 754

<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (625)..(625)
<223> n is a, c, g, or t

<400> 13
 ggagaccttg gctggtcaga gggctgtgaa gacgcacggt gccaggacca agtatctgaa 60
 agacctggtg gaagaggagg ctgaggaggc tggagtggct ttgagaagca cccagagcac 120
 actgcaagca ggtctggctg cagatgcctg ggctgctccc atcgccatgc agatctacaa 180
 gaagcgcctg ggccagctgg cctgctgctg cctgcaccgc cgggccaaaa ggaggcctcc 240
 tatgaccag gtgtacgaga ggctagagaa gctgcaggca gtggtggcgg gggtgcccg 300
 gcatttggag gccgccagct gcatcccccc ttccccgcag gagaactcct acgtgtccag 360
 cactggcaga gcccacagtg gggctgctcc atggcagccc ctggcagcgc catcaggagc 420
 cagtgccag gcagcagagc agctgcagag agggcccaac cagcccgagg agagtgcga 480
 gagcctaggc ggcctctctg ctgccctgcg ctccctggcac ttgactccaa gctgccctct 540
 ggaccagca cccctcaggc aggcgggctg tcctcagggg gacacggcag gagaatcgag 600
 ctgggggagt ggcccaggat cccgngccac agccgtggaa ggactgggtc ttggcagctc 660
 tgcacatcg tcgtcagagc caccgcagat tatcatcaac cctgcccagc agaagatggt 720
 ccagaagctg gccctgtacg aggatgggtc cctg 754

<210> 14
<211> 577
<212> DNA
<213> Homo sapiens

<400> 14
 gaggccgagg cctggagccc ccggaagttg ccacccctcag ccyyccacctt cctctcccca 60
 gcttttccag gctcccagac ccattcaggg cctgagctcg gcctgggtcc aagccctgct 120
 tccctgtggc ctccaccgcc atctccagcc tgggtgacag agcaagaccc tgtttcaaaa 180
 agaaaaaccc tgggaaaagt gaagtatggc tgtaagtctc atggttcagt cctagcaaga 240
 agcgagaatt ctgagatcct ccagaaagtc gagcagcacc cacctccaac ctcgggccag 300
 tgtcttcagg ctttactggg gacctgcgag ctggccta atgtggtgcct gcaagccagg 360
 ccatccctgg gcgccacaga cgagctccga gccaggtcag gcttcggagg ccacaagctc 420
 agcctcaggc ccaggcactg attgtggcag aggggccact acccaaggtc tagctaggcc 480
 caagacctag ttaccagac agtgagaagc ccctggaagg cagaaaagtt gggagcatgg 540
 cagacaggga agggaaamat tttcaggga aagacat 577

<210> 15
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 15
cctggcttgc aggccaccac 20

<210> 16
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 16
gatgccagcc ttccttgccc 20

<210> 17
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 17
cagtggagac ggtcctccag 20

<210> 18
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 18
cttgtggcct ccgaagcctg 20

<210> 19
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 19
ggacgacagc agctgcaggc 20

<210> 20
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 20
tctgcagcca gacctgcttg 20

<210> 21
<211> 20
<212> DNA
<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 21
agccagacct gcttgcaagtg 20

<210> 22
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 22
gtgaagcctg tgctacagcc 20

<210> 23
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 23
tggcaccagt cggcgggctc 20

<210> 24
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 24
gaccatcttc tgtcgggcag 20

<210> 25
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 25
ccagccttcc cgtcttgatg 20

<210> 26
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 26
agccagcagc ctcccaacat 20

<210> 27
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 27
tcagctctga aattcatcac 20

<210> 28
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 28
cagtccttcc acggctgtgg 20

<210> 29
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 29
ccaaggtctc tagcactacc 20

<210> 30
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 30
ctaggtcttg ggcctagcta 20

<210> 31
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 31
acaccgtgtt cctcatcacc 20

<210> 32
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 32
ctctgaaatt catcactttc 20

<210> 33
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 33
tgggtcatag gaggcctcct 20

<210> 34
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 34
gctcggagct cgtctgtggc 20

<210> 35
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 35
tggcaccgtg cgtcttcaca 20

<210> 36
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 36
cggcacatga cccagggcgg 20

<210> 37
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 37
tgaccagcca aggtctctag 20

<210> 38
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 38
ctcctcttcc accaggtctt 20

<210> 39
<211> 20
<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 39

tgaccatgag aactttgact

20

<210> 40

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 40

aagggccagt ccttccacgg

20

<210> 41

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 41

ctggacacgt aggagttctc

20

<210> 42

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 42

tgctggacac gtaggagttc

20

<210> 43

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 43

accatcttct gtcgggcagg

20

<210> 44

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense Oligonucleotide

<400> 44

cttgacgtgt gctctgggtg

20

<210> 45

<211> 20

<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 45
ctggacagct gctccacctc 20

<210> 46
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 46
acagccctgg gctacttttg 20

<210> 47
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 47
ggaggcaggg ttccactctg 20

<210> 48
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 48
tgcagccaga cctgcttgca 20

<210> 49
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 49
cttgggtagt ggcccctctg 20

<210> 50
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 50
ggccagtcct tccacggctg 20

<210> 51

<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 51
tctgagcaca gtagccagca

20

<210> 52
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 52
cggagcagct gcaggtgcgt

20

<210> 53
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 53
aagcagggct tggaaccagg

20

<210> 54
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 54
cgatcttgag ctctccgag

20

<210> 55
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 55
cacctcggtc aggaagctct

20

<210> 56
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 56
caggaagccg tacaccaggc

20

<210> 57
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 57
actgtctgtg tccgggccac

20

<210> 58
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 58
cagctggccc aggccaggc

20

<210> 59
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 59
gcccggcggt gcaggcagca

20

<210> 60
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 60
gcttctctag cctctcgtac

20

<210> 61
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 61
ggctgccatg gagcagcccc

20

<210> 62
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 62
gcagctgctc tgctgcctgg

20

<210> 63
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 63
agagaggccg cctaggctct

20

<210> 64
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 64
cagagggcag cttggagtca

20

<210> 65
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 65
agggccagct tctggaccat

20

<210> 66
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 66
ggtgaacaca tcagctctga

20

<210> 67
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 67
agctgctgcc agaggcctgg

20

<210> 68
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 68
ttacagccat acttcacttt

20

<210> 69
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 69
aattctcgt tcttgctagg

20

<210> 70
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 70
ggccagctcg caggtcccca

20

<210> 71
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 71
ccttccctgt ctgccatgct

20

<210> 72
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 72
acgcaagagg acactcgtt

20

<210> 73
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 73
ggctgaacac aaaatcactg

20

<210> 74
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 74

tgactcacgg ctgaacacaa

20

<210> 75
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 75
atacgttttt attactcaag

20

<210> 76
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 76
agggaacata cgtttttatt

20

<210> 77
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 77
cctggaaaag cttcataaag

20

<210> 78
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 78
ctggcctcac ctggacagct

20

<210> 79
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 79
agaccctcca gctacgctgc

20

<210> 80
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 80
ggagagccca cttgaagaca

20

<210> 81
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 81
agctggctac ctgggtcata

20

<210> 82
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 82
tacagagcaa ggcctggaat

20

<210> 83
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 83
tccttctctc tatgtgaagg

20

<210> 84
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 84
aggccaagc ctacagaagg

20

<210> 85
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 85
aggccagctg gccaggcgc

20

<210> 86
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense Oligonucleotide

<400> 86
accacaggctg gagatggcgg

20

<210> 87
<211> 20
<212> DNA
<213> Homo sapiens

<400> 87
gtggtggcct gcaagccagg

20

<210> 88
<211> 20
<212> DNA
<213> Homo sapiens

<400> 88
gggcaaggaa ggctggcatc

20

<210> 89
<211> 20
<212> DNA
<213> Homo sapiens

<400> 89
ctggaggacc gtctccactg

20

<210> 90
<211> 20
<212> DNA
<213> Homo sapiens

<400> 90
caggcttcgg aggccacaag

20

<210> 91
<211> 20
<212> DNA
<213> Homo sapiens

<400> 91
gcctgcagct gctgtcgtcc

20

<210> 92
<211> 20
<212> DNA
<213> Homo sapiens

<400> 92
caagcaggtc tggctgcaga

20

<210> 93
<211> 20
<212> DNA
<213> Homo sapiens

<400> 93
cactgcaagc aggtctggct

20

<210> 94
<211> 20
<212> DNA

<213> Homo sapiens

<400> 94
ggctgtagca caggcttcac 20

<210> 95
<211> 20
<212> DNA
<213> Homo sapiens

<400> 95
gagcccgccg actggtgcca 20

<210> 96
<211> 20
<212> DNA
<213> Homo sapiens

<400> 96
ctgcccgaca gaagatggtc 20

<210> 97
<211> 20
<212> DNA
<213> Homo sapiens

<400> 97
catcaagacg ggaaggctgg 20

<210> 98
<211> 20
<212> DNA
<213> Homo sapiens

<400> 98
atgttgggag gctgctggct 20

<210> 99
<211> 20
<212> DNA
<213> Homo sapiens

<400> 99
gtgatgaatt tcagagctga 20

<210> 100
<211> 20
<212> DNA
<213> Homo sapiens

<400> 100
ccacagccgt ggaaggactg 20

<210> 101
<211> 20
<212> DNA
<213> Homo sapiens

<400> 101
ggtagtgcta gagaccttgg 20

<210> 102
<211> 20

<212> DNA
<213> Homo sapiens

<400> 102
tagctaggcc caagacctag

20

<210> 103
<211> 20
<212> DNA
<213> Homo sapiens

<400> 103
ggtgatgagg aacacggtgt

20

<210> 104
<211> 20
<212> DNA
<213> Homo sapiens

<400> 104
aggaggcctc ctatgaccca

20

<210> 105
<211> 20
<212> DNA
<213> Homo sapiens

<400> 105
tgtgaagacg cacggtgcca

20

<210> 106
<211> 20
<212> DNA
<213> Homo sapiens

<400> 106
ccgccctggg tcatgtgccg

20

<210> 107
<211> 20
<212> DNA
<213> Homo sapiens

<400> 107
aagacctggt ggaagaggag

20

<210> 108
<211> 20
<212> DNA
<213> Homo sapiens

<400> 108
agtcaaagtt ctcattgtca

20

<210> 109
<211> 20
<212> DNA
<213> Homo sapiens

<400> 109
gagaactcct acgtgtccag

20

<210> 110

<211> 20
<212> DNA
<213> Homo sapiens

<400> 110
gaactcctac gtgtccagca

20

<210> 111
<211> 20
<212> DNA
<213> Homo sapiens

<400> 111
cctgcccgcac agaagatggt

20

<210> 112
<211> 20
<212> DNA
<213> Homo sapiens

<400> 112
caccagagc acactgcaag

20

<210> 113
<211> 20
<212> DNA
<213> Homo sapiens

<400> 113
gaggtggagc agctgtccag

20

<210> 114
<211> 20
<212> DNA
<213> Homo sapiens

<400> 114
caaaagtagc ccagggctgt

20

<210> 115
<211> 20
<212> DNA
<213> Homo sapiens

<400> 115
cagagtggaa ccctgcctcc

20

<210> 116
<211> 20
<212> DNA
<213> Homo sapiens

<400> 116
tgcaagcagg tctggctgca

20

<210> 117
<211> 20
<212> DNA
<213> Homo sapiens

<400> 117
cagaggggcc actaccaag

20

<210> 118
<211> 20
<212> DNA
<213> Homo sapiens

<400> 118
cagccgtgga aggactggcc

20

<210> 119
<211> 20
<212> DNA
<213> Homo sapiens

<400> 119
tgctggctac tgtgctcaga

20

<210> 120
<211> 20
<212> DNA
<213> Homo sapiens

<400> 120
acgcacctgc agctgctccg

20

<210> 121
<211> 20
<212> DNA
<213> Homo sapiens

<400> 121
cctggttcca agccctgctt

20

<210> 122
<211> 20
<212> DNA
<213> Homo sapiens

<400> 122
ctcggaggag ctcaagatcg

20

<210> 123
<211> 20
<212> DNA
<213> Homo sapiens

<400> 123
agagcttcct gaccgaggtg

20

<210> 124
<211> 20
<212> DNA
<213> Homo sapiens

<400> 124
gcctggtgta cggcttcctg

20

<210> 125
<211> 20
<212> DNA
<213> Homo sapiens

<400> 125
gtggcccgga cacagacagt

20

<210> 126
<211> 20
<212> DNA
<213> Homo sapiens

<400> 126
tgctgcctgc accgccgggc

20

<210> 127
<211> 20
<212> DNA
<213> Homo sapiens

<400> 127
gtacgagagg ctagagaagc

20

<210> 128
<211> 20
<212> DNA
<213> Homo sapiens

<400> 128
ccaggcagca gagcagctgc

20

<210> 129
<211> 20
<212> DNA
<213> Homo sapiens

<400> 129
agagcctagg cggcctctct

20

<210> 130
<211> 20
<212> DNA
<213> Homo sapiens

<400> 130
atggtccaga agctggccct

20

<210> 131
<211> 20
<212> DNA
<213> Homo sapiens

<400> 131
ccaggcctct ggcagcagct

20

<210> 132
<211> 20
<212> DNA
<213> Homo sapiens

<400> 132
aaagtgaagt atggctgtaa

20

<210> 133
<211> 20
<212> DNA
<213> Homo sapiens

<400> 133
cctagcaaga agcgagaatt

20

<210> 134
<211> 20
<212> DNA
<213> Homo sapiens

<400> 134
tggggacctg cgagctggcc

20

<210> 135
<211> 20
<212> DNA
<213> Homo sapiens

<400> 135
agcatggcag acaggaagg

20

<210> 136
<211> 20
<212> DNA
<213> Homo sapiens

<400> 136
aaccgagtgt cctcttgct

20

<210> 137
<211> 20
<212> DNA
<213> Homo sapiens

<400> 137
cagtgatttt gtgttcagcc

20

<210> 138
<211> 20
<212> DNA
<213> Homo sapiens

<400> 138
ttgtgttcag ccgtgagtca

20

<210> 139
<211> 20
<212> DNA
<213> Homo sapiens

<400> 139
cttgagtaat aaaaacgtat

20

<210> 140
<211> 20
<212> DNA
<213> Homo sapiens

<400> 140
tgtcttcaag tgggctctcc

20

<210> 141
<211> 20
<212> DNA
<213> Homo sapiens

<400> 141

attccaggcc ttgctctgta

20

<210> 142
<211> 20
<212> DNA
<213> Homo sapiens

<400> 142
ccttcacata gagagaagga

20

<210> 143
<211> 20
<212> DNA
<213> Homo sapiens

<400> 143
ccgccatctc cagcctgggt

20